Lending Club Case Study

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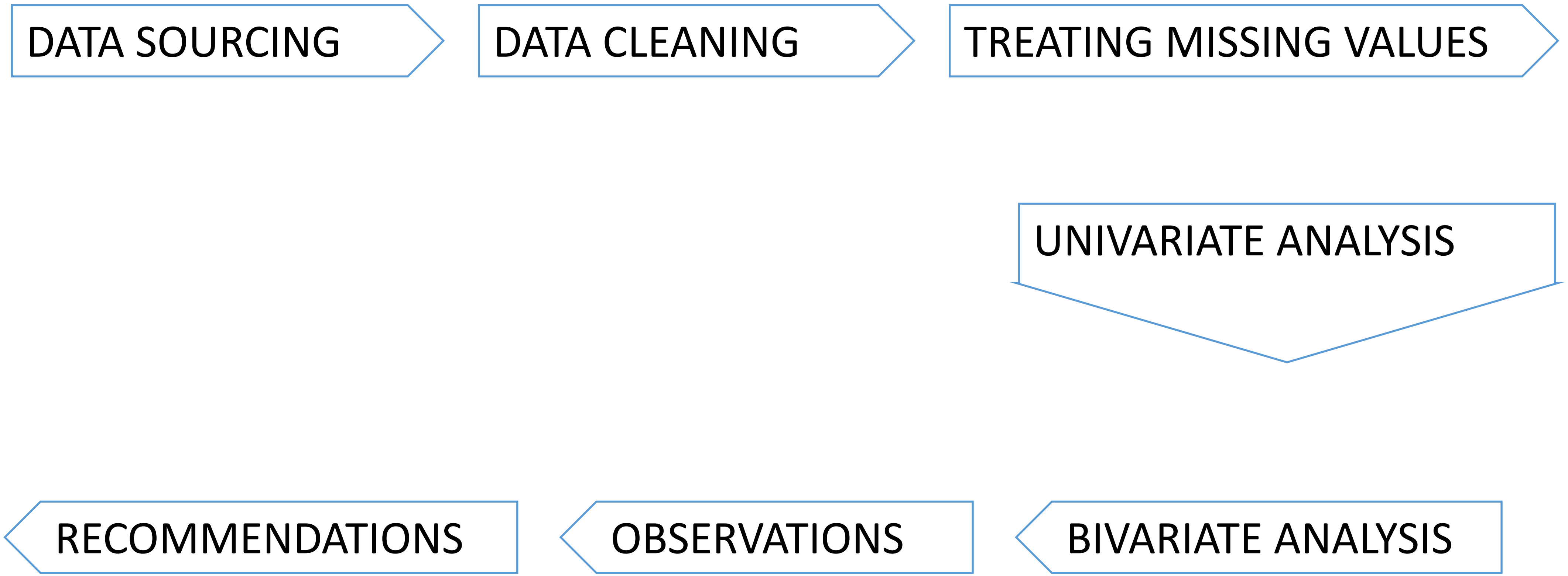
Problem statement:

Lending club is a online platform which provides all types of loans such as business loans, personal loans,etc.. So while carrying on with this service, there are a few risks involved that needs to be taken under consideration such as lending loans to ‘risky’ applicants is the largest source of financial loss.borrowers who default cause the largest amount of loss to the lenders. In this case, the customers labelled as 'charged-off' are the 'defaulters'.

Our objective is to identify these risky applicants through our analysis and give appropriate solutions for them.

Flow of the Analysis:



Data Cleaning:

1. Column Cleaning:

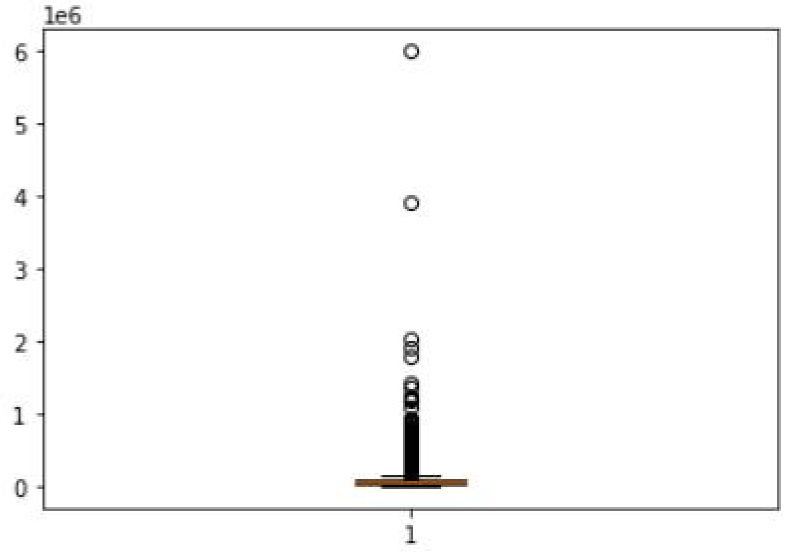
- Deleting columns that have null values throughout.
- Deleting those columns that have same value throughout because that wont be of any help is our analysis.
- After deleting above columns, there are still some columns that wont be of any help in our analysis so deleting them as well.
- After all the deductions, the total number of columns left are 21.

2. Row cleaning:

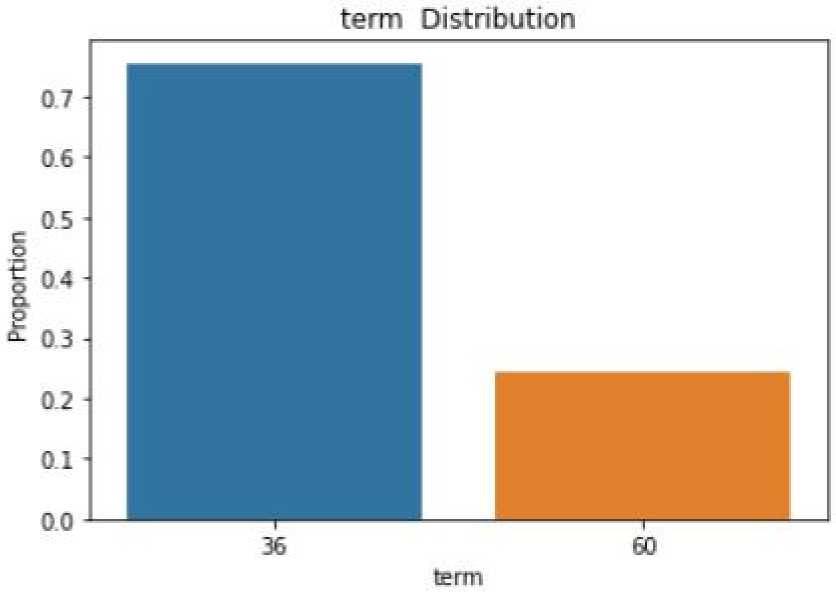
- As we donot need the current loan status rows because their loan tenure is yet to get completed so we will drop the rows having loan status as current.

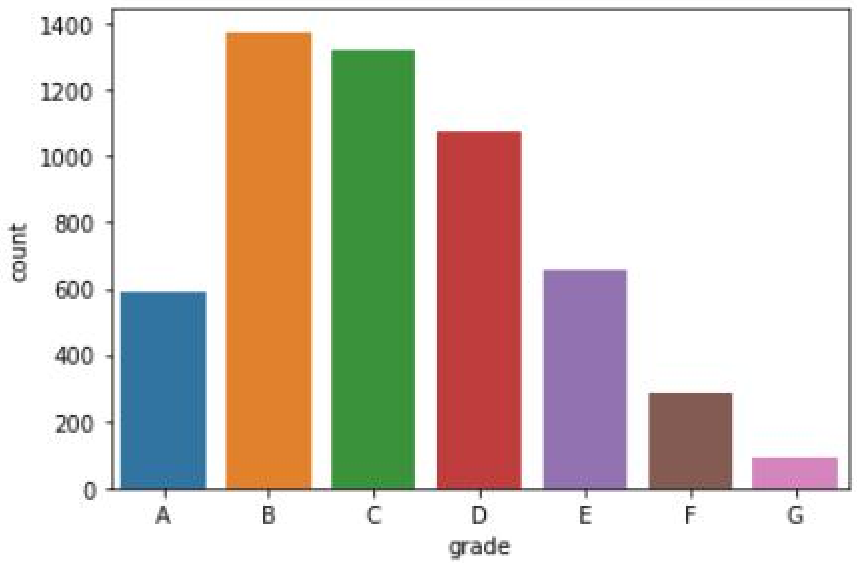
Outliers Analysis:

1. **Annual Income**: As shown in the plot below, there are certain applicants who has higher income as compared to others, thus deleting those values above 95 percentile.



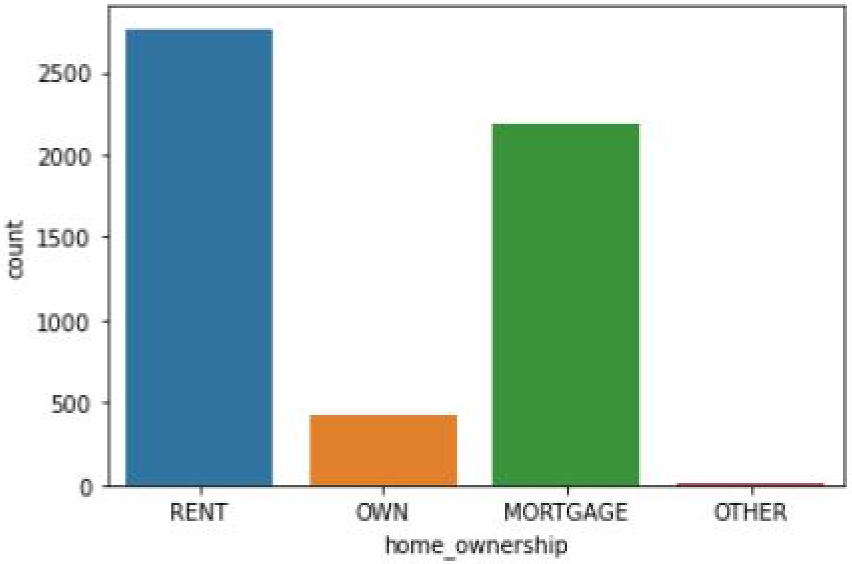
Univariate Analysis:

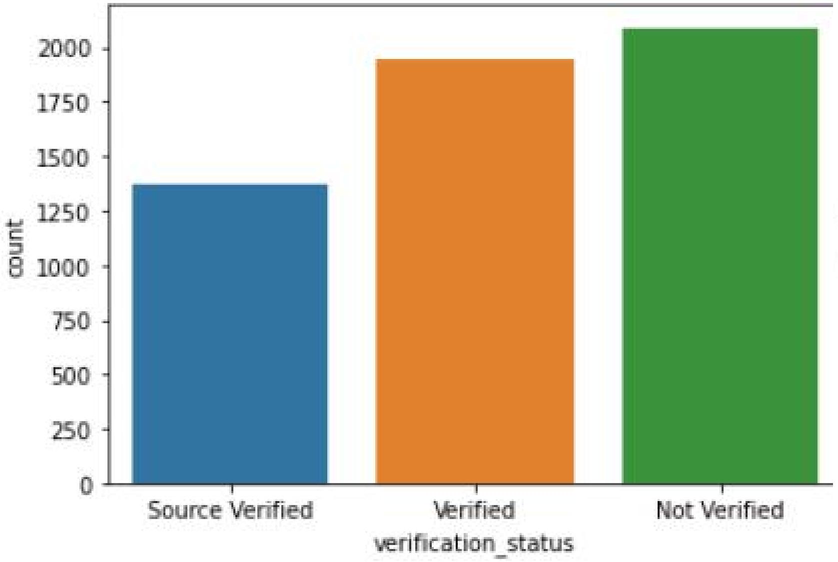


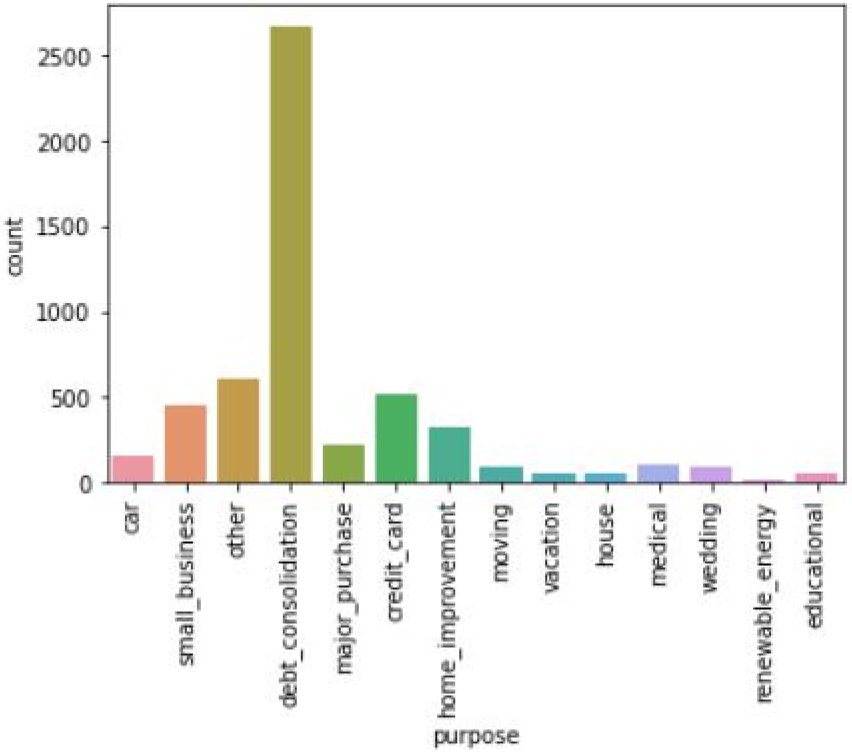


Applicants applied for 36 months of tenure for loan clearance are more than compared to those of 60 months.

Applicants having Grades with B and C have more charged off loan borrowers







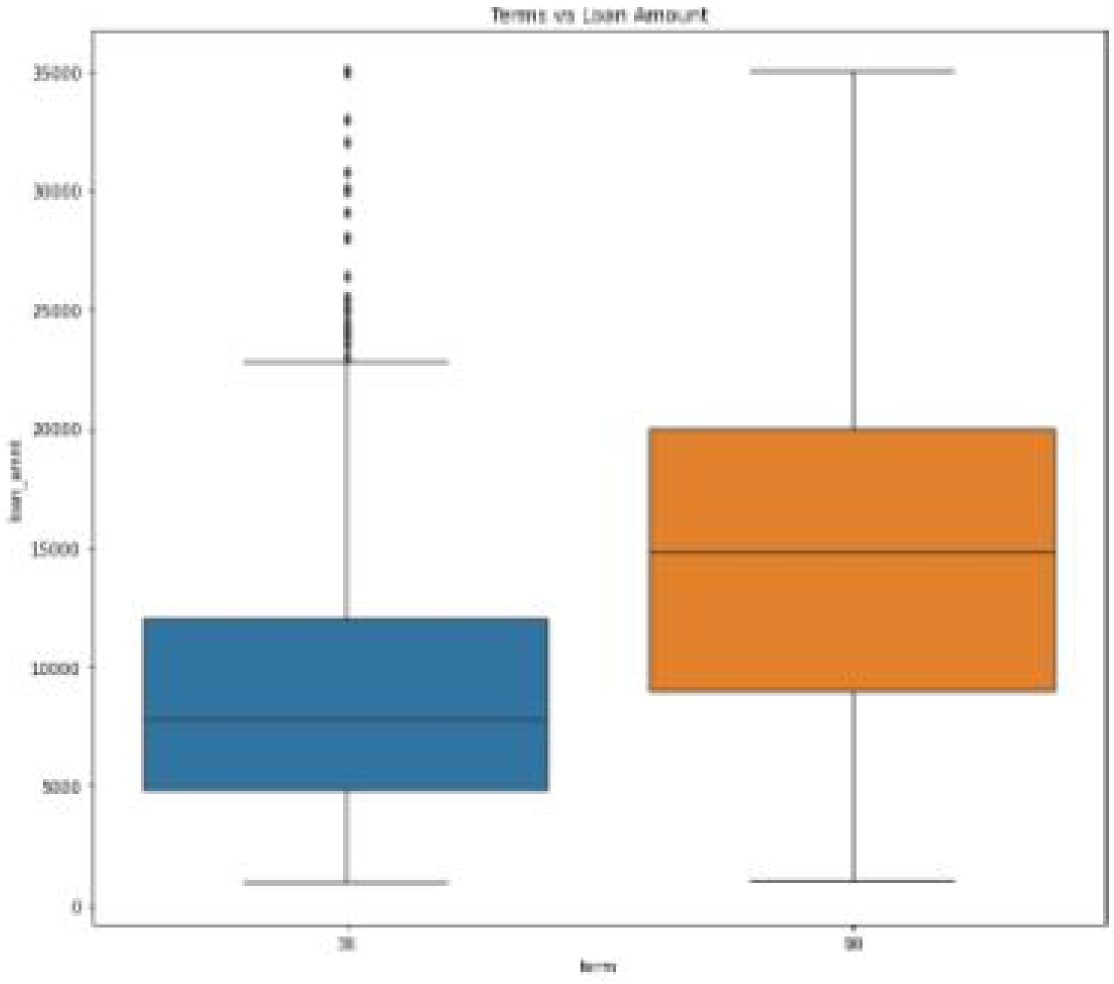
Applicants living in rent and Mortgage house are likely to get defaulted

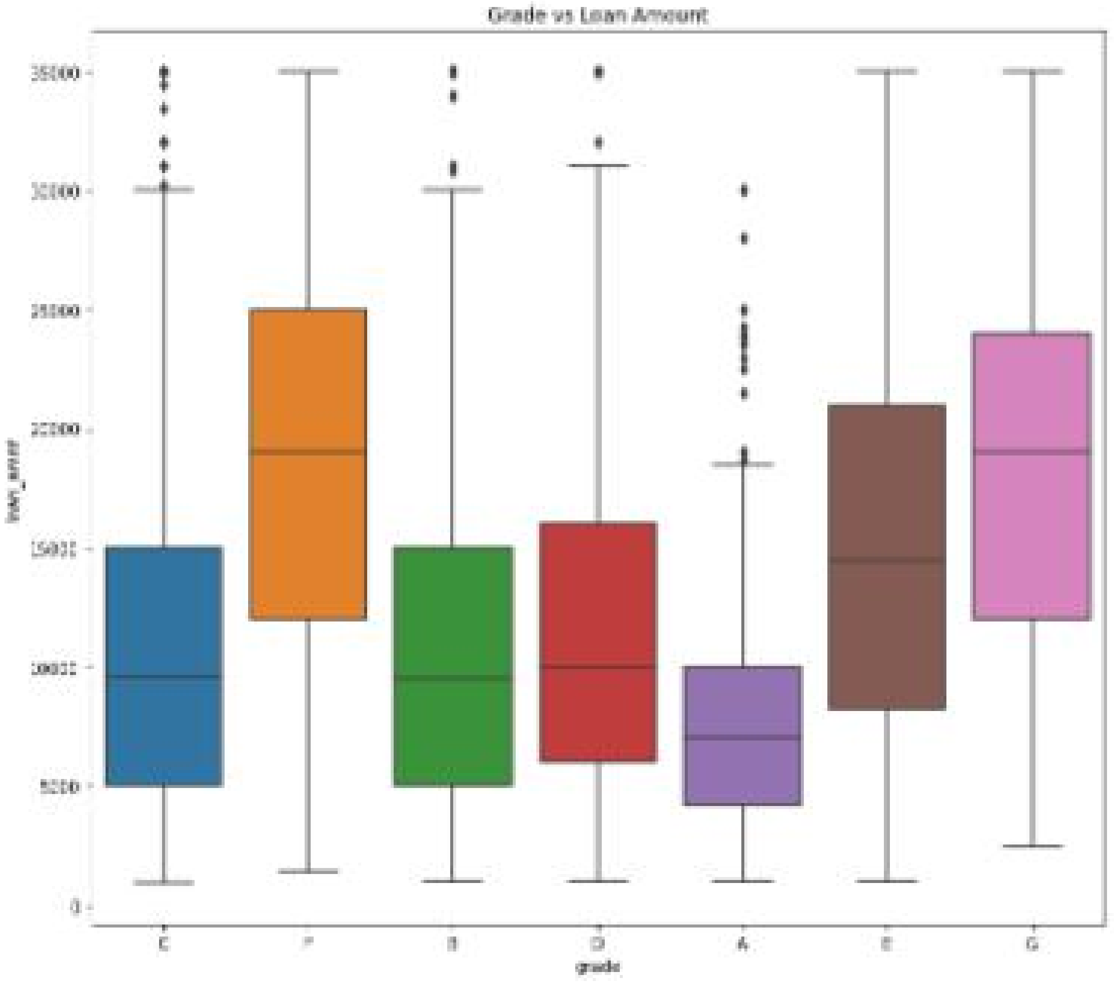
Most of the loans that are charged off were issued without the verification o applicants income.

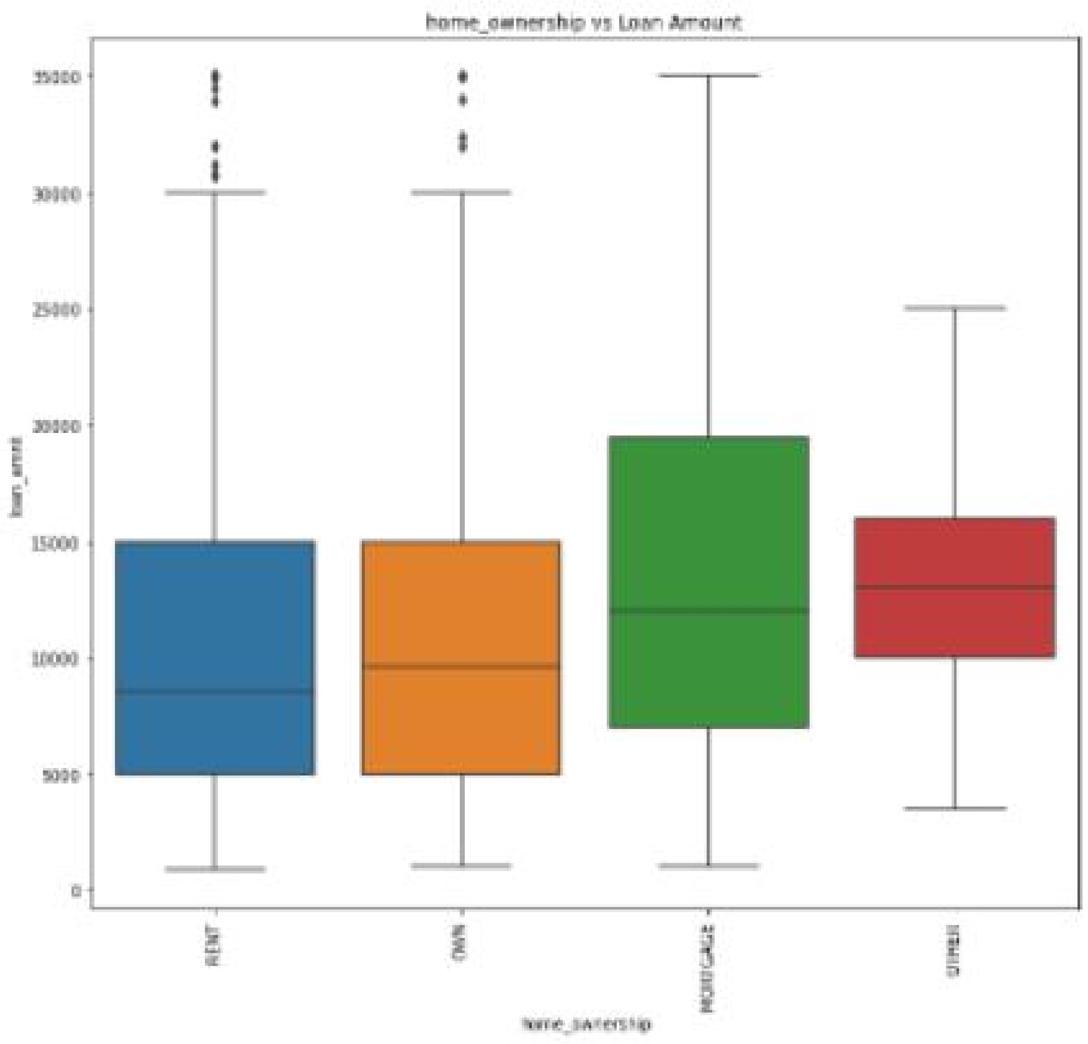
Most of the charged off applicants are buying loans for debt consolidation

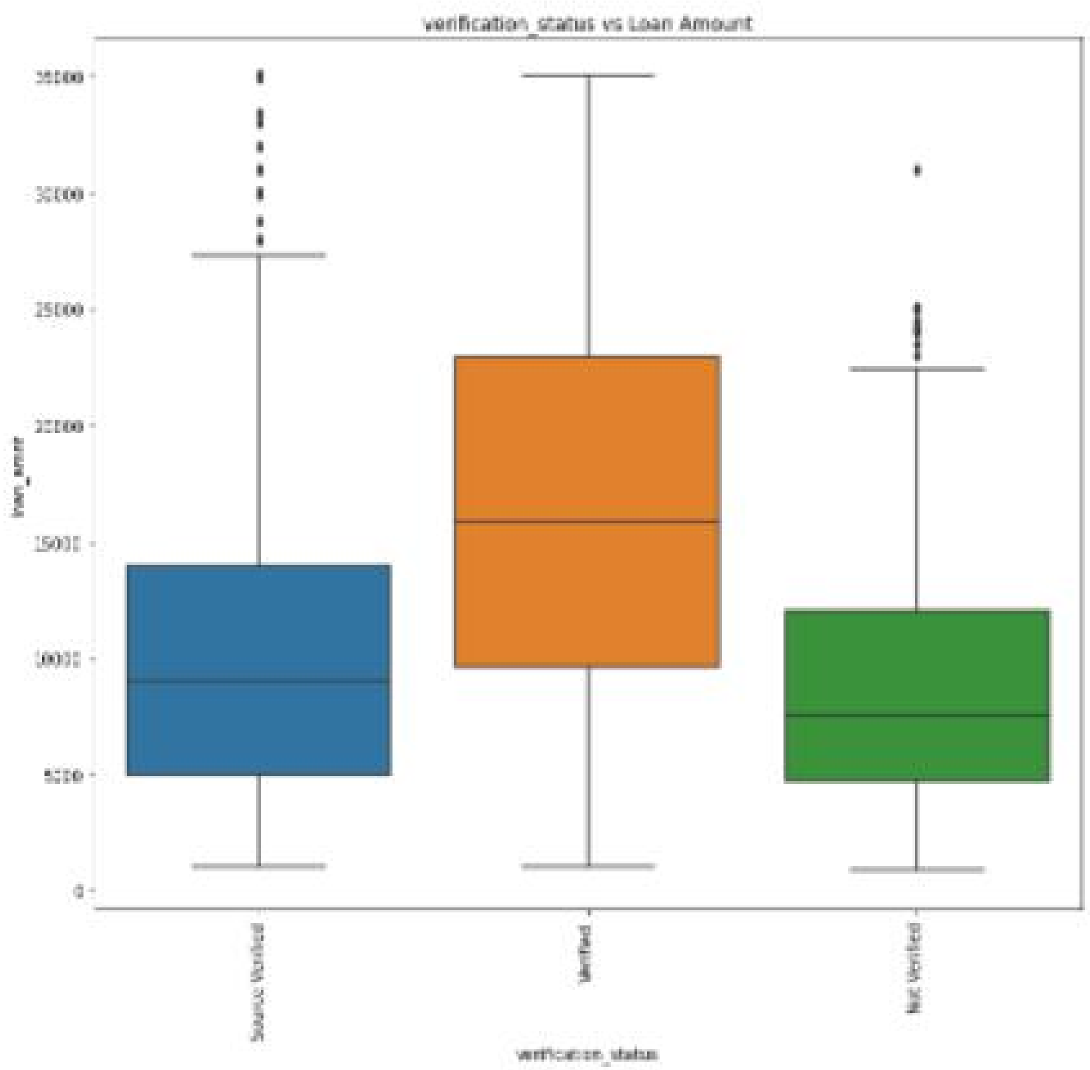
Segmented Univariate analysis:

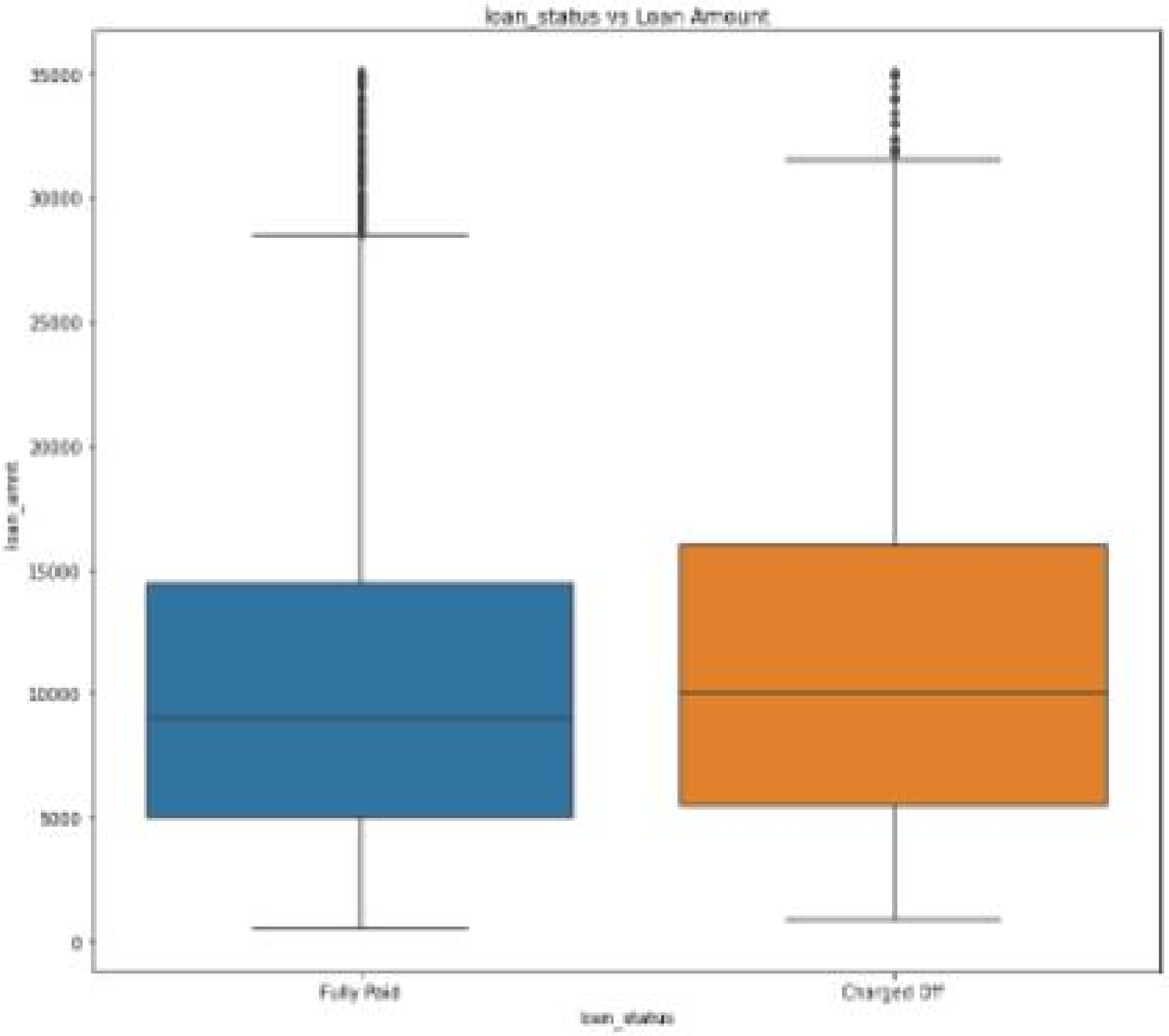
1. Loan Amount:






home_ownership vs Loan Amount
35000
30000
25000
20000
15000
10000
5000
0
loan_amnt
RENT
OWN
MORTGAGE
OTHER
home_ownership


verification_status vs Loan Amount
35000
30000
25000
20000
15000
10000
5000
0
loan_amnt
Source Verified
Verified
Not Verified
verification_status



loan_status vs Loan Amount
35000
30000
25000
20000
15000
10000
5000
0
loan_amnt
Fully Paid
Charged Off
loan_status

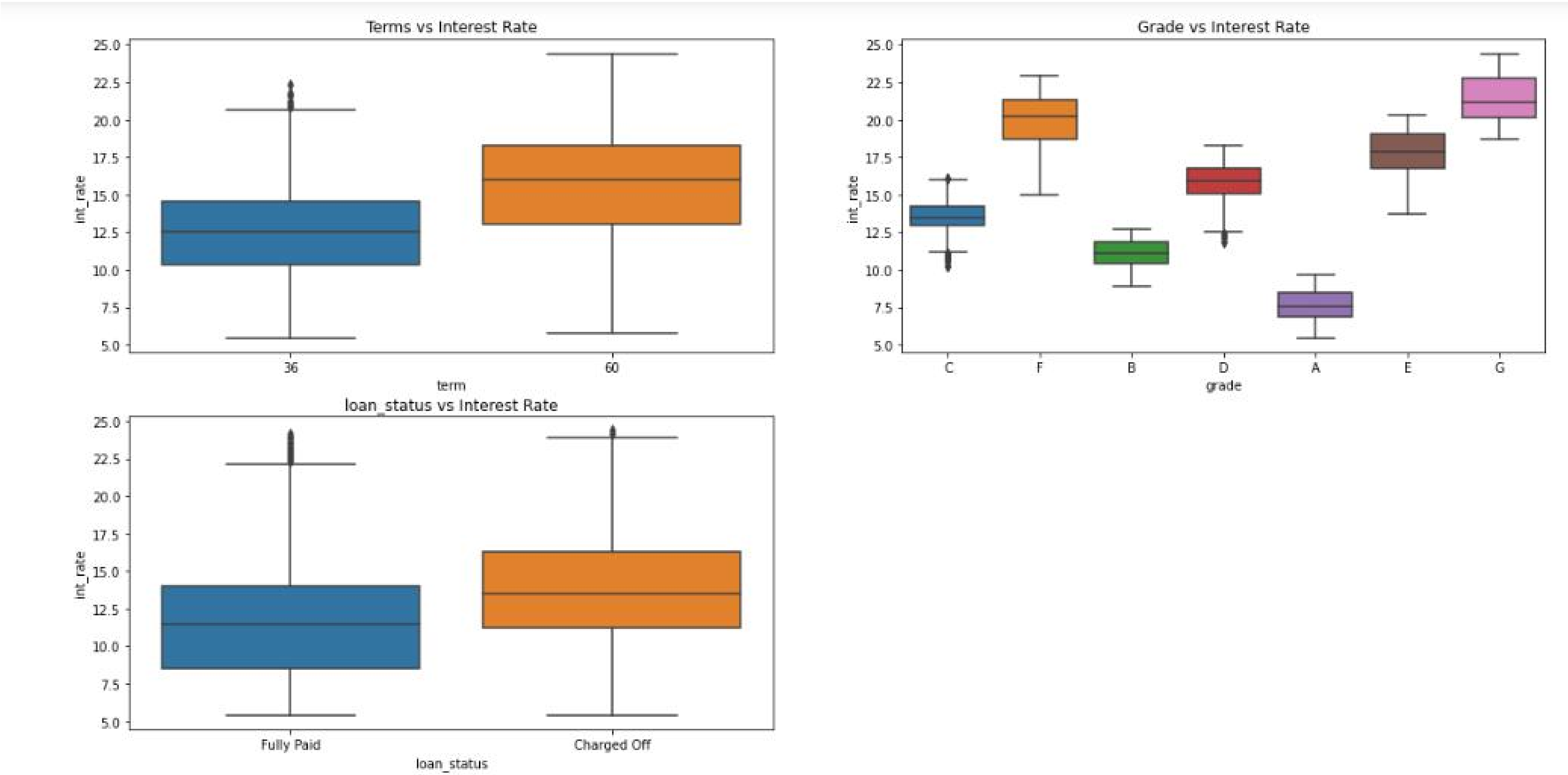
Analysis of above plots with respect to loan amount:

- Higher the loan amount, higher the term.
- Grade F and G have the highest loan amount which means that as the grades are decreasing , the loan amount is increasing
- Applicants living in Mortgage have taken the higher loan amount.
- The company has not verified the income for applicants with lower loan amount(<10000)
- Most of the applicants whose loan amount is greater than 10000 were not able to pay the loan amount on time.

2. **Funded Amount**:

The analysis of funded amount issimilar to that of loan amount.

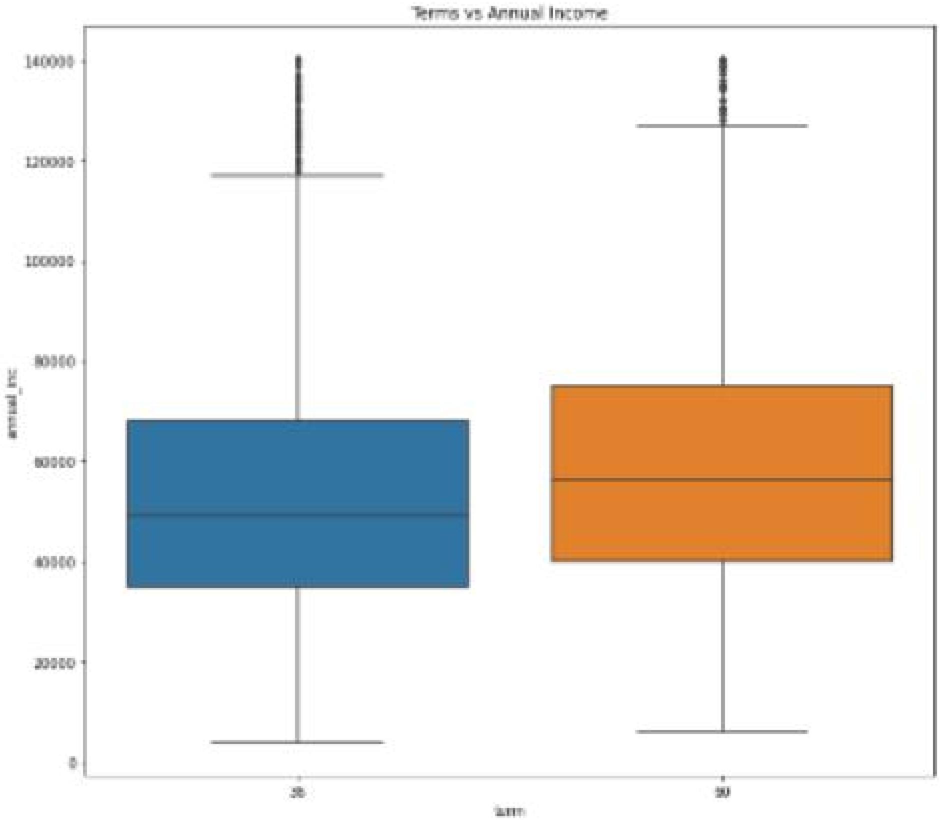
3: Interest Rate:

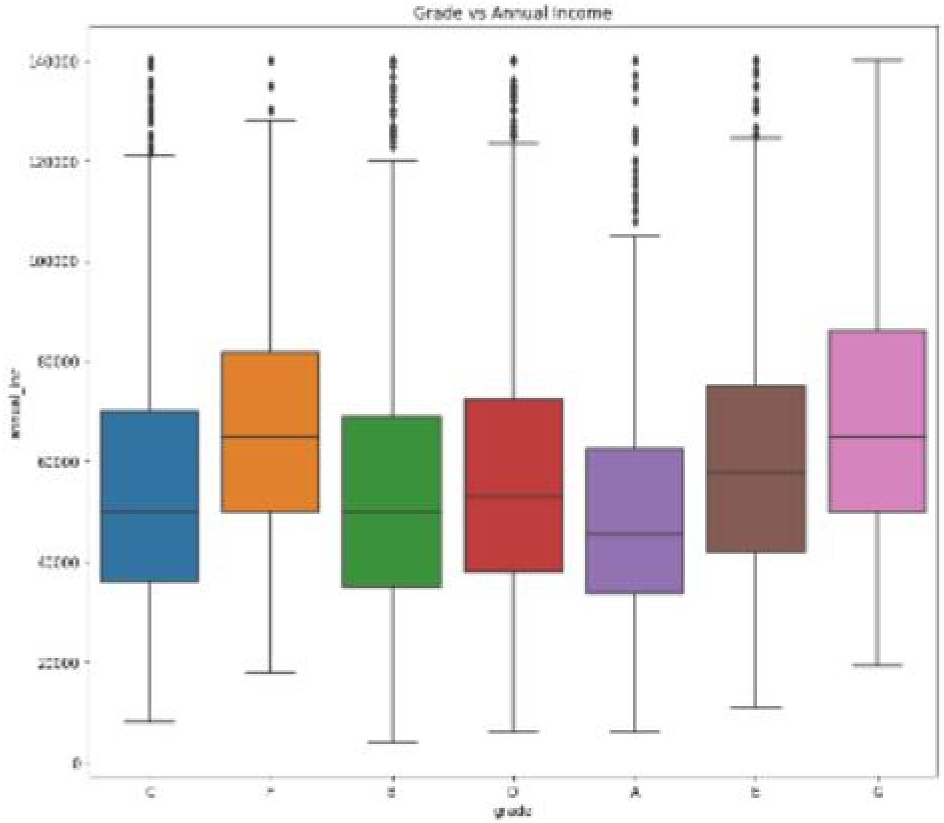


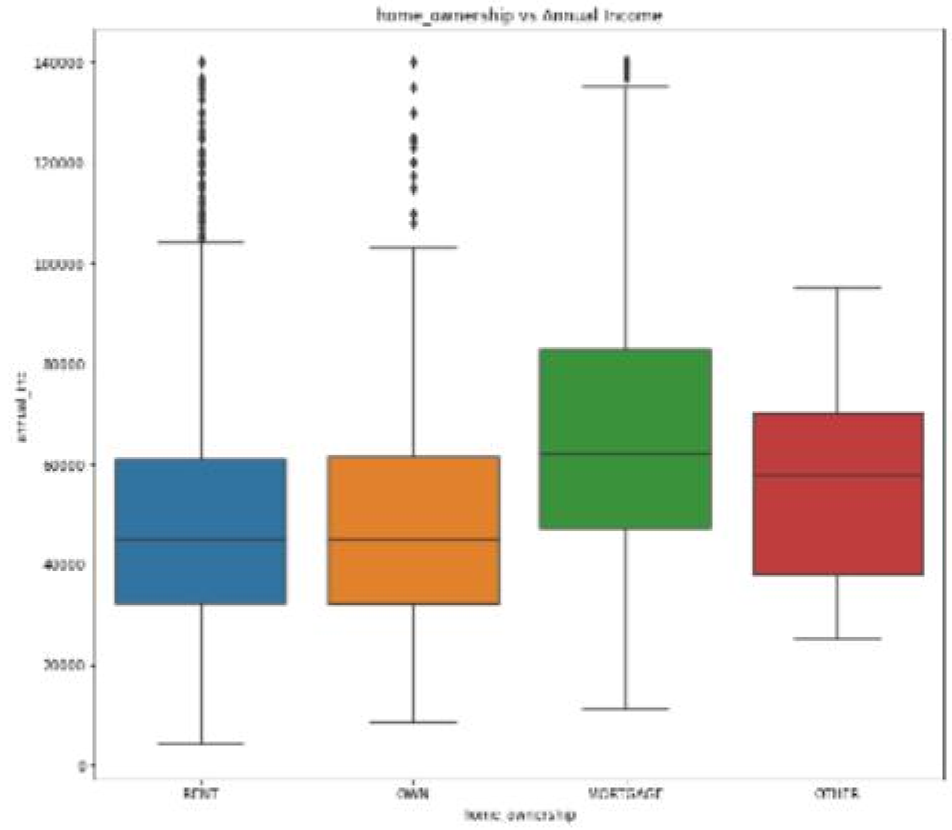
Analysis of above plots with respect to interest rate:

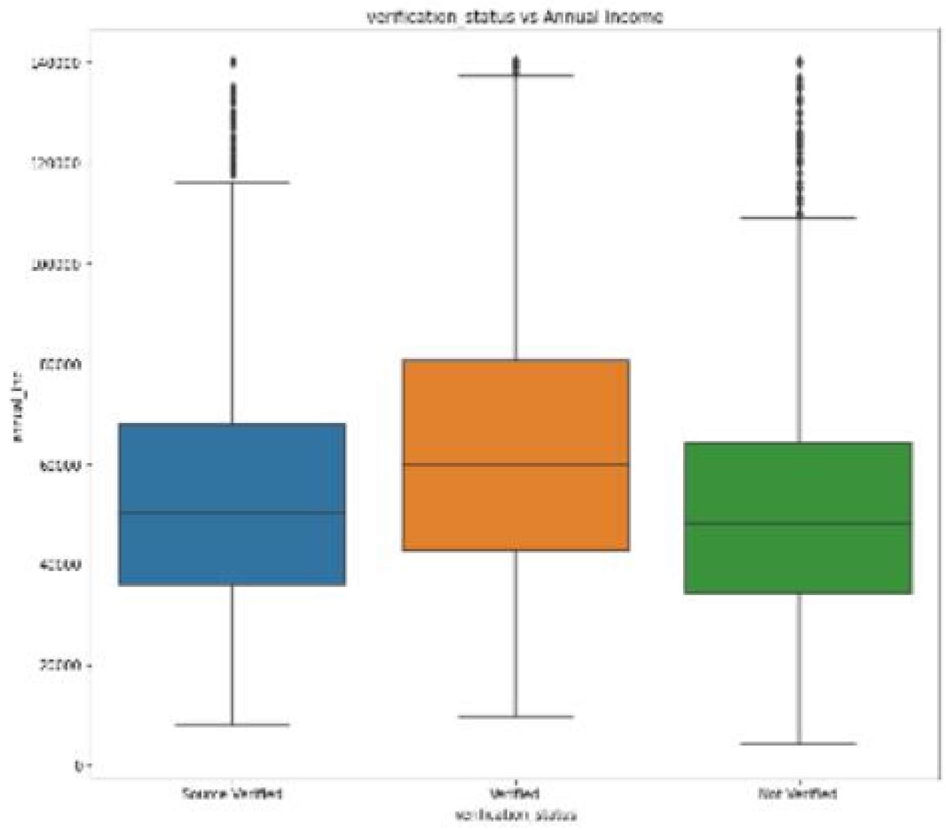
- Interest rate is higher for the loans with higher tenure.
- As the grade reduces, the interest rate increases.
- Interest rate for charged off applicants is higher than the fully paid applicants

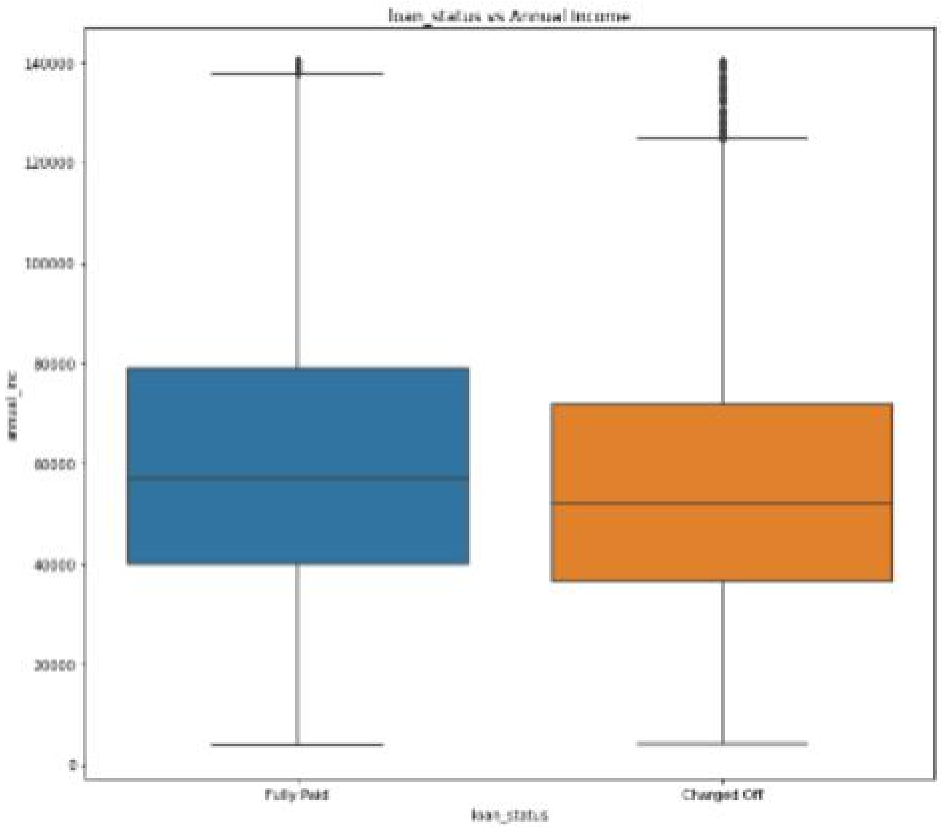
4. Annual Income:

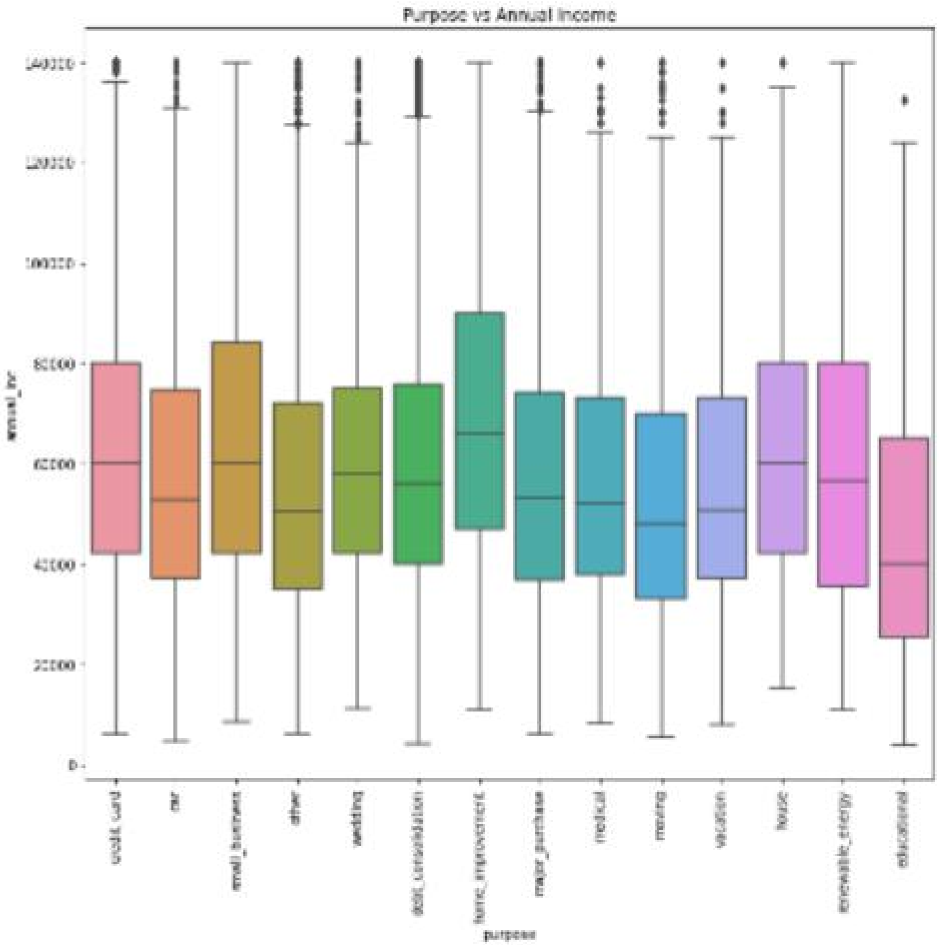





home_ownership vs Annual Income
140000
120000
100000
80000
60000
40000
20000
0
annual_inc
RENT
OWN
MORTGAGE
OTHER
home_ownership


verification_status vs Annual Income
140000
120000
100000
80000
60000
40000
20000
0
annual_inc
Source Verified
Verified
Not Verified
verification_status





Analysis of above plots with respect to annual income:

- Annual income is higher for lower grades
- The applicants having mortgage house ownership have the highest annual income
- The applicants whose loan applications are verified have the highest annual income.
- Applicants with more salary generally applied for home-improvement,house, renewable_energy and small_businesses.

OBSERVATIONS	RECOMMENDATIONS
Most of the charged off applicants were generated because their income verification was not done	Income verification of each applicant should be the priority.
Applicants living in rent/ mortgage houses were likely to default	These applicants should be given the loan of lesser amount which they can refund on time.